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METHOD OF REDUCING NO_x IN DIESEL ENGINE EXHAUST

ABSTRACT OF THE DISCLOSURE

This invention provides a method of reducing nitrogen oxides in an oxygen containing exhaust stream using ethanol as a reductant for plasma-assisted selective catalytic reduction. The exhaust gas, generated from a diesel engine or other lean-burn power source, comprises nitrogen oxides, especially NO. Ozone generated from a plasma reactor is injected into the exhaust stream to convert NO to NO₂ and the plasma injection is followed by the addition of ethanol. The NO₂ is then reduced by contacting the exhaust stream with a dual-bed catalytic reactor comprising BaY (or NaY) and CuY zeolite catalysts in the presence of ethanol as the reductant. The plasma power density and the molar ratio of ethanol to NO_x fed to the catalytic reactor are controlled as a function of the catalyst temperature for the best performance of the plasma-catalyst system. An average conversion of NO_x to N₂ of at least 90% is achieved over the temperature range of 200-400°C.